AMENDMENTS TO THE CLAIMS

1. (Previously Presented): A system for enhancing object state awareness to track a plurality of approaching airborne objects, comprising:

a receiver subsystem to receive reference signals from an uncontrolled transmitter and scattered transmissions originating from the uncontrolled transmitter and scattered by an object of said plurality of approaching airborne objects;

a front-end processing subsystem to determine a radial velocity of the object based on the received transmissions and to buffer digitized transmission replicas of the received transmissions; and

a back-end processing subsystem to receive the digitized transmission replicas of the received transmissions and to determine object state estimates based on the determined radial velocity, wherein said front-end processing subsystem and said back-end processing subsystem are remotely located relative to one another.

2. (Original): The system of claim 1, wherein said scattered transmissions comprise ambient transmissions.

3. (Previously Presented): The system of claim 1, further comprising initial position information for said object, wherein said initial position information of an airborne object is communicated to said system separately from said scattered transmissions.

4. (Original): The system of claim 1, further comprising an output device to display said object state estimates.

5. (Original): The system of claim 1, further comprising a communication link to couple said receiver subsystem, said front-end processing subsystem and said back-end processing subsystem.

6. (Previously Presented): A passive coherent location system for monitoring a predetermined location within airspace, comprising:

a receiver subsystem to receive scattered transmissions scattered by an object within said

airspace and to output digitized signals of said scattered transmissions, said scattered transmissions originating from an uncontrolled transmitter;

a front-end processing subsystem to determine a frequency-difference-of-arrival for said digitized signals and to buffer digitized transmission replicas of said digitized signals; and

a back-end processing subsystem to receive the digitized transmission replicas and to determine positional information for said object in accordance with said frequency-difference-of-arrival, wherein said front-end processing subsystem and said back-end processing subsystem are independent and remotely located relative to one another.

7. (Original): The system of claim 6, further comprising an output device to provide said positional information for said object.

8. (Original): The system of claim 6, further comprising a reference signal from said uncontrolled transmitter, said reference signal being used to determine said frequency-difference-of-arrival for said digitized signals.

9. (Original): The system of claim 6, further comprising a radial velocity calculation of said object determined from said frequency-difference-of-arrival.

10. (Original): The system of claim 6, further comprising an antenna subsystem to detect said scattered transmissions.

11. (Original): The system of claim 10, wherein said antenna subsystem comprises a phased array antenna.

12. (Original): The system of claim 6, wherein said receiver subsystem comprises an ultrahigh dynamic range receiver.

13. (Original): The system of claim 6, further comprising a communication link between said front-end processing subsystem and said back-end processing subsystem.

14. (Previously Presented): A method for determining an updated state estimate for an object, comprising:

receiving a reference transmission from an uncontrolled transmitter and a scattered transmission that originated from said uncontrolled transmitter and that was scattered by the object;

using a front-end processing system, comparing the received transmissions to determine a measurement differential;

updating a previous state estimate based on the determined measurement differential;

buffering digitized transmission replicas of said received transmissions, wherein said digitized replicas are received by a back-end processing subsystem remotely located relative to said front-end processing system; and

issuing a warning when said object is within a predetermined distance from a ground location.

15. (Original): The method of claim 14, further comprising determining an initial state estimate for said object.

16. (Original): The method of claim 14, further comprising selecting said uncontrolled transmitter from a plurality of transmitters.

17. (Original): The method of claim 14, further comprising determining whether said object is moving.

18. (Original): The method of claim 14, further comprising outputting said updated state estimate.

19. (Original): The method of claim 14, further comprising terminating said receiving when said object is out-of-range.

20. (Original): The method of claim 14, wherein said warning is issued to an air traffic control system.

21. (Original): The method of claim 14, wherein said warning is issued to a pilot.

22. (Previously Presented): A method for determining an updated state estimate for an object, comprising:

receiving a reference transmission from an uncontrolled transmitter and a scattered transmission that originated from said uncontrolled transmitter and was scattered by the object;

using a front-end processing system, comparing the received transmissions to determine a measurement differential;

updating a previous state estimate based on the measurement differential;

buffering digitized transmission replicas of said received transmissions, wherein said digitized replicas are received by a back-end processing subsystem remotely located relative to said front-end processing system; and

issuing a warning when said object undertakes an airpath, wherein said airpath intersects with another object.

23. (Currently Amended): A method for tracking an object using a civil aviation passive coherent location system, comprising:

selecting a transmitter transmitting a reference transmission;

receiving said reference transmission;

receiving a scattered transmission scattered by an object within an airspace, wherein said scattered transmission is transmitted from said transmitter;

using a front-end processing system, comparing said scattered transmission to said reference transmission to determine measurement differentials;

buffering digitized transmission replicas of said scattered transmissions and said reference transmissions, wherein said digitized transmission replicas are received by a back-end processing subsystem remotely located relative to said front-end processing system; and

updating~~; and~~ an object state estimate according to said measurement differentials.

24. (Original): The method of claim 23, further comprising outputting said updated object state estimate.

25. (Original): The method of claim 23, wherein said measurement differentials include a frequency-difference-of-arrival.

26. (Original): The method of claim 23, wherein said measurement differentials include a time-difference-of-arrival.

27. (Original): The method of claim 23, wherein said measurement differentials include an angle of arrival.

28. (Previously Presented): A system for determining an updated state estimate for an object, comprising:

means for receiving a reference transmission from an uncontrolled transmitter and a scattered transmission that originated from said uncontrolled transmitter and was scattered by the object;

means for comparing the received transmission within a front-end processing subsystem to determine a measurement differential;

means for updating a previous state estimate based on the determined measurement differential;

means for buffering digitized transmission replicas of said received transmissions, wherein said digitized replicas are received by a back-end processing subsystem remotely located relative to said front-end processing system; and

means for issuing a warning when said object is within a predetermined distance.

29. (Previously Presented): A system for determining an updated state estimate for an object, comprising:

means for receiving a reference transmission from an uncontrolled transmitter and a scattered transmission that originated from said uncontrolled transmitter and was scattered by the object;

means for comparing the received transmission within a front-end processing subsystem to determine a measurement differential;

means for updating a previous state estimate based on the measurement differential;

means for buffering digitized transmission replicas of said received transmissions, wherein said digitized replicas are received by a back-end processing subsystem remotely located relative to said front-end processing system; and

means for issuing a warning when said object undertakes an airpath, wherein said airpath intersects with another object.

30. (Currently Amended): A system for tracking an object using a civil aviation passive coherent location system, comprising:

means for selecting a transmitter transmitting a reference transmission;

means for receiving said reference transmission;

means for receiving a scattered transmission scattered by an object within an airspace, wherein said scattered transmission is transmitted from said transmitter;

means for comparing said scattered transmission to said reference transmission within a front-end processing subsystem to determine measurement differentials;

means for buffering digitized transmission replicas of said scattered transmissions and said reference transmissions, wherein said digitized transmission replicas are received by a back-end processing subsystem remotely located relative to said front-end processing system and wherein said buffered digitized transmission replicas can be transmitted for analysis upon request by a user; and

means for updating an object state estimate according to said measurement differentials.

31. (Currently Amended): A system for enhancing object state awareness to track a plurality of approaching airborne objects, comprising:

a receiver subsystem to receive reference signals from a plurality of controlled and uncontrolled transmitters and scattered transmissions originating from the plurality of transmitters and scattered by an object of said plurality of approaching airborne objects;

a front-end processing subsystem to determine a radial velocity of the object based on the received transmissions and to buffer digitized transmission replicas of the received transmissions; and

a back-end processing subsystem to received the digitized transmission replicas of the

received transmissions to determine object state estimates based on the determined radial velocity, wherein said front-end processing subsystem and said back-end processing subsystem are remotely located relative to one another.

32. (Previously Presented): The method of claim 14, further comprising receiving an initial state estimate for said object separately from said scattered transmission.